

AMENDMENT TO THE SPECIFICATION

On page 1 lines 1-2, please amend the Title of the Invention as follows:

PERPENDICULAR MAGNETIC RECORDING HEAD HAVING A TRAILING  
SHIELD STRUCTURE AND METHOD FOR CREATING SAME.

On page 22 lines 1-2 please amend the Title of the Invention as follows:

PERPENDICULAR MAGNETIC RECORDING HEAD HAVING A TRAILING  
SHIELD STRUCTURE AND METHOD FOR CREATING SAME.

AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

- 1 1. (Currently Amended) A magnetic head having an air bearing surface (ABS),
- 2 comprising:
- 3 a writing pole, comprising:
- 4 a pole tip for writing data to magnetic media via lines of flux emitted
- 5 from an ABS end of the writing pole;

6 a shaping layer coupled to the pole tip, the shaping layer being for  
7 focusing flux to the pole tip;  
8 a trailing shield spaced apart from the writing pole, the trailing shield causing the  
9 lines of flux to enter the media at an angle from a plane perpendicular to a  
10 surface of the media facing the writing pole; and  
11 a non-magnetic mask layer co-planar to the trailing shield which defines the  
12 height of the trailing shield;  
13 wherein a throat height of the trailing shield is less than a distance from the ABS  
14 end of the writing pole to the shaping layer.

1 2. (Cancelled) A magnetic head as recited in claim 1, wherein a throat height of the  
2 trailing shield is less than a distance from the ABS end of the writing pole to the  
3 shaping layer.

1 3. (Original) A magnetic head as recited in claim 1, wherein a ratio of a distance  
2 between the pole tip and the trailing shield, and a distance between the ABS end  
3 of the pole tip and a writeable layer of the media, is between about 2:1 and about  
4 1:2.

1 4. (Original) A magnetic head as recited in claim 1, wherein a distance between the  
2 pole tip and the trailing shield is less than about 50 nm.

- 1 5. (Original) A magnetic head as recited in claim 1, wherein the trailing shield is not  
2 magnetically continuous to a back gap of the magnetic head.
- 1 6. (Currently Amended) A magnetic head as recited in claim 1, wherein the trailing  
2 shield is magnetically ~~continuous to a back gap~~ connected with a return pole of  
3 the magnetic head.
- 1 7. (Original) A magnetic head as recited in claim 1, further comprising a return  
2 pole, the trailing shield being positioned between the writing pole and the return  
3 pole.
- 1 8. (Original) A magnetic head as recited in claim 7, wherein the return pole is  
2 stitched to the trailing shield at a position recessed from the ABS.
- 1 9. (Original) A magnetic head as recited in claim 1, wherein the head is a  
2 perpendicular head.
- 1 10. (Original) A magnetic head as recited in claim 1, wherein the trailing shield is  
2 positioned adjacent a mask material, the mask material defining a throat height of  
3 the trailing shield.
- 1 11. (Original) A magnetic head as recited in claim 10, wherein a height of the mask  
2 material is greater than a distance from the trailing shield to the ABS.

HIT1P035/HSJ9-2003-0154US1

4

1 12. (Currently Amended) A magnetic head structure for perpendicular recording and  
2 reading, the magnetic head structure having an air bearing surface (ABS),  
3 comprising:  
4 a write head portion for writing data to magnetic media, the write head portion  
5 including:  
6 a first pole piece, ~~the first pole piece having a first pole tip;~~  
7 a probe pole piece, the probe pole piece having a probe pole tip for  
8 emitting magnetic flux from an ABS end thereof;  
9 an insulation stack positioned between the pole pieces;  
10 at least one write coil embedded in the insulation stack;  
11 a shaping layer positioned between the probe pole piece and the  
12 ~~insulation stack~~ first pole piece, the shaping layer being for  
13 focusing flux to the probe pole tip; and  
14 a trailing shield spaced apart from the probe pole piece, the trailing  
15 shield causing the magnetic flux to enter the media at an  
16 angle from a plane perpendicular to a surface of the media  
17 facing the probe pole tip; and  
18 ~~a return pole piece;~~ and  
19 a ~~non-magnetic~~ non-magnetic mask layer which is coplanar to the trailing shield;  
20 wherein a throat height of the trailing shield is less than a distance from the ABS  
21 end of the probe pole tip to the shaping layer.

1 13. (Cancelled) A magnetic head structure as recited in claim 12, wherein a throat  
2 height of the trailing shield is less than a distance from the ABS end of the probe  
3 pole tip to the shaping layer.

1 14. (Original) A magnetic head structure as recited in claim 12, wherein a ratio of a  
2 distance between the probe pole tip and the trailing shield, and a distance between  
3 the ABS end of the probe pole tip and a writeable layer of the media, is between  
4 about 2:1 and about 1:2.

1 15. (Original) A magnetic head structure as recited in claim 12, wherein a distance  
2 between the probe pole tip and the trailing shield is less than about 50 nm.

1 16. (Currently Amended) A magnetic head structure as recited in claim 12, wherein  
2 the trailing shield is not magnetically continuous to a back gap of the magnetic  
3 head structure.

1 17. (Original) A magnetic head structure as recited in claim 12, wherein the trailing  
2 shield is magnetically ~~continuous to a back gap~~ connected with a return pole of  
3 the magnetic head structure.

1 18. (Currently Amended) A magnetic head structure as recited in claim 12, wherein  
2 the return pole piece is stitched to the trailing shield at a position recessed from  
3 the ABS.

1 19. (Original) A magnetic head structure as recited in claim 12, wherein the trailing  
2 shield is positioned adjacent a mask material, the mask material defining a throat  
3 height of the trailing shield.

1 20. (Original) A magnetic head structure as recited in claim 19, wherein a height of  
2 the mask material is greater than a distance from the trailing shield to the ABS.

1 21. (Withdrawn) A method for forming a head having a trailing shield, comprising:  
2 forming a gap layer above a pole;  
3 forming a mask above the gap layer; and  
4 forming a trailing shield above the gap layer and adjacent the mask, a throat  
5 height of the trailing shield being defined between the mask.

1 22. (Withdrawn) A method as recited in claim 21, wherein the pole has a pole tip for  
2 writing data to magnetic media via lines of flux emitted from an air bearing  
3 surface (ABS) of the pole, the pole also having a shaping layer coupled to the pole  
4 tip, the shaping layer being for focusing flux to the pole tip.

1 23. (Withdrawn) A method as recited in claim 21, wherein the gap layer is a  
2 nonmagnetic metal, wherein the trailing shield is formed by plating.

- 1 24. (Withdrawn) A method as recited in claim 23, wherein the trailing shield is  
2 overplated such that the trailing shield covers a portion of the mask.
- 1 25. (Withdrawn) A method as recited in claim 21, further comprising forming a  
2 return pole such that the trailing shield is positioned between the pole and the  
3 return pole.
- 1 26. (Withdrawn) A method as recited in claim 25, wherein the return pole is stitched  
2 to the trailing shield.
- 1 27. (Withdrawn) A method as recited in claim 21, wherein the mask is not removed  
2 from the head.
- 1 28. (Withdrawn) A method as recited in claim 21, wherein a height of the mask is  
2 greater than a distance from the trailing shield to the ABS.
- 1 29. (Withdrawn) A method as recited in claim 21, wherein a throat height of the  
2 trailing shield less than a distance from the ABS end of the pole to the shaping  
3 layer.
- 1 30. (Withdrawn) A method as recited in claim 21, wherein a ratio of a distance  
2 between the pole tip and the trailing shield, and a distance between the ABS end

3 of the pole tip and a writeable layer of the media, is between about 2:1 and about  
4 1:2.

1 31. (Withdrawn) A method as recited in claim 21, wherein a distance between the  
2 pole tip and the trailing shield is less than about 50 nm.

1 32. (Withdrawn) A magnetic storage system, comprising:  
2 magnetic media;  
3 at least one head for reading from and writing to the magnetic media, each head  
4 having:  
5 a write head portion for writing data to the medium via lines of flux  
6 oriented substantially perpendicular to a surface of the media  
7 facing the write head portion, the write head portion including:  
8 a pole tip for writing data to magnetic media via lines of  
9 flux emitted from an ABS end of the pole;  
10 a shaping layer coupled to the pole tip, the shaping layer  
11 being for focusing flux to the pole tip; and  
12 a trailing shield spaced apart from the pole, the trailing  
13 shield causing the lines of flux to enter the media at  
14 an angle from a plane perpendicular to a surface of  
15 the media facing the pole;  
16 a non-magnetic mask layer which is coplanar to the trailing shield;  
17 a slider for supporting the head; and



18 a control unit coupled to the head for controlling operation of the head.